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LISTING OF THE CLAIMS:

1. (Currently Amended) A method of tracking and compensating for changes in a multi-channel, dense wavelength division multiplexing (DWDM) network, comprising

employing a dither feedback mechanism which uses optical filters that are already part of the network for add/drop functions; and

dithering the optical filter bandpass about the center wavelength of each channel in use in the network to obtain a measurement of the optical transfer function (OTF) in the network at any instant in real-time;

wherein, when the network configuration is changed by adding or dropping wavelengths, the resulting change in the OTF ~~can be~~ is tracked and feedback signals are used to compensate for the change by adjusting wavelengths of optical signals ~~transmitted through the optical filter bandpass, with respect to a transmission peak of said filter bandpass~~ in the network to maintain a defined optical transfer function in the network.

2. (Original) A method according to Claim 1, wherein the feedback mechanism is based on a wavelength locked loop and allows a spectral decomposition (optical power vs. wavelength) with very fast response corrections and hence enables the use of networks with more wavelengths spaced more closely together at a specified bit-error rate (BER).

3. (Currently Amended) A method of adjusting for changes in optical signals transmitted through ~~an~~ a multi-channel optical network, comprising:

transmitting a set of optical signals through a network, each of the optical signals having a respective wavelength;

tracking changes to said set of signals by passing each of the signals through a filter having a bandpass function, and dithering the filter bandpass about the wavelengths of each of said set of signals to generate filter output signals; and

using the filter output signals to adjust the network or the set of optical signals to compensate for said changes by adjusting the wavelengths of some of the optical signals ~~with respect to a transmission peak of the filter bandpass~~ in the network to maintain a defined optical transfer function in the network.

4. (Previously Presented) A method according to Claim 3, for use with an optical control monitor having a filter for adding or dropping optical signals from the network, and wherein the tracking step includes the step of passing at least some of the optical signals through the filter of the optical control monitor.

5. (Original) A method according to Claim 3, further comprising the step of dropping optical signals from the network, and wherein the step of using the filter output signals includes the step of

adjusting the set of optical signals or the network to compensate for the dropping of optical signals from the network.

6. (Original) A method according to Claim 3, further comprising the step of adding optical signals to the network, and wherein the step of using the filter output signals includes the step of adjusting the set of optical signals or the network to compensate for the adding of optical signals to the network.

7. (Original) A method according to Claim 3, wherein each of the filter output signals represents the difference between a passband wavelength of the filter and the wavelength of a respective one of the signals passed through the filter.

8. (Original) A method according to Claim 3, wherein the using step includes the steps of:

using the filter output signals to generate a power density signal representing the spectral power density of said set of optical signals; and

using the power density signal to adjust said spectral power density in response to changes in said power density.

9. (Currently Amended) A method according to Claim 3, wherein the using step includes the steps of:

processing said filter output signals to generate a further signal ~~representing changes in the optical spectrum of said set of optical signals~~ proportional to the magnitude and the direction of the difference between the passband wavelength of the filter and the wavelength of one of the signals passed through the filter; and

using said further signal to adjust the optical network or the set of optical signals to compensate for said changes in the optical spectrum.

10. (Original) A method according to Claim 9, further comprising the step of dithering at least one of the optical signals at a given rate; and wherein the processing step includes the steps of:

generating a dither signal at said given rate, and

mixing the dither signal with at least one of the filter output signals.

11. (Currently Amended) ~~An~~ A multi-channel optical control monitor comprising:

a receiver for receiving a set of optical signals, each of the optical signals having a respective wavelength; and

a tracking circuit to track changes to said set of signals, including

i) a filter having a bandpass function,

ii) means to pass said set of optical signals through the filter, wherein ~~the wavelengths of the optical signals are dithered relative to~~ the filter bandpass is dithered to generate filter output signals, and

iii) a control for using the filter output signals to make a defined adjustment to compensate for said changes by adjusting the wavelengths of the optical signals ~~with respect to a transmission peak of the filter bandpass~~ in the network to maintain a defined optical transfer function in the network.

12. (Original) An optical control monitor according to Claim 11, for use with an optical network, and wherein the filter is adapted to add or drop optical signals from the network.

13. (Original) An optical control monitor according to Claim 12, wherein the control makes said adjustment to compensate for the dropping of optical signals from the network.

14. (Original) An optical control monitor according to Claim 12, wherein the control makes said adjustment to compensate for the adding of optical signals to the network.

15. (Original) An optical control monitor according to Claim 11, wherein each of the filter output signals represents the difference between a passband wavelength of the filter and the wavelength of a respective one of the signals passed through the filter.

16. (Original) An optical control monitor according to Claim 11, wherein the control includes:

means to use the filter output signals to generate a power density signal representing the spectral power density of said set of optical signals; and

means to use the power density signal to make the defined adjustment in response to changes in said power density.

17. (Original) An optical control monitor according to Claim 11, wherein the control includes;

a dither source for generating a dither signal; and

a mixer for mixing the dither signal with at least one of the filter output signals.

18. (Currently Amended) A combination add unit and drop unit for ~~an~~ a multi-channel optical network, the combination comprising:

an add unit comprising means for transmitting a set of optical signals, each of the optical signals having a respective wavelength; and a first dither source for dithering at least one of the optical signals; and

a drop unit comprising a receiver for receiving the set of optical signals; and a tracking circuit to track changes to said set of signals, the tracking circuit including

a filter having a bandpass function,

means to pass said set of optical signals through the filter, wherein ~~the wavelengths of the optical signals are dithered relative to~~ the filter bandpass[,] is dithered to generate filter output signals, and

a control for using the filter output signals to make a defined adjustment to compensate for said changes by adjusting the wavelengths of the optical signals ~~with respect to a transmission peak of the filter bandpass~~ in the network to maintain a defined optical transfer function in the network..

19. (Original) A combination add unit and drop unit according to Claim 18, wherein the control includes:

a second dither source for generating a dither signal; and

a mixer for mixing the dither signal with the at least one of the filter output signals.

20. (Original) A combination according to Claim 19, wherein:

the first dither source dithers said at least one of the optical signals at a given rate; and

the second dither source dithers the dither signal at said given rate.